

INTERNATIONAL AERONAUTICAL CONGRESS

SPACE GENERATION CONGRESS

October 2015

Shalom Aleikhem (shah-LOHM ah-ley-KHEM) ...

I always look forward to meeting with all of you, and it's great to be able to join you here in Jerusalem.

One of the things I've always noticed about the members of the Space Generation Congress is that you tend to have a great, entrepreneurial spirit. What sometimes in the United States we like to call a "can-do" spirit.

It's a similar spirit that defines Israel's tech center. Israel has been called a "start-up nation" and I'd be willing to wager that this is a term you'll be hearing a lot during your time here in Israel.

Israel has the highest percentage of high-tech startups anywhere in the world. It's been estimated that nearly a thousand new Israeli startups launch each and every year.

When you look specifically at aerospace, more than 44,000 people work at more than 150 Israeli companies in aerospace related fields.

Things like innovation and entrepreneurship are contagious. They feed off each other and it's my sincere hope that as you return to your home countries, you'll be mindful of the ways that, thru your own enthusiasm and excitement, you have an opportunity to be "ambassadors" of science, space exploration and discovery.

As I've had the blessing of being able to travel our world in my role as Administrator of NASA, I've become more and more convinced that the universal human language is imagination.

One of the great things about those stunning images of Pluto that mesmerized people across the world this summer, courtesy of NASA's *New Horizons* mission, is that they captured, the hearts, minds and imaginations of people across the globe.

We felt this same sort of excitement and interest when NASA announced just a couple weeks ago that we've confirmed the existence of flowing water on the surface of Mars.

What's more, we are feeling the energy and excitement as audiences flock to films like "*The Martian*" – and in turn, begin to imagine, dream, hope, wonder, explore, study, question and learn.

So if you remember nothing else I say to you tonight, I hope you'll be mindful of the responsibility you have, as some of your generation's best and brightest minds, to be leaders not only in aerospace, but also in imagination.

SPACE BRINGS THE WORLD TOGETHER

With this in mind, I'd be remiss if I didn't make a point to tell you how special it is to be with you here in Jerusalem of all places. In fact, it's absolutely awe-inspiring.

Here we are in the place where so much of our world's history began – and we're gathered here to talk about the new chapter of human history that you will be writing ... a chapter that will be, quite literally, "out of this world."

In writing this chapter your generation has an opportunity to do something very special. At the very same time you expand humanity's reach into space, you also have a chance to bring people closer together here on Earth.

With this in mind, I want to share with you a few words from the late Israeli astronaut, Ilan Ramon:

"There is no better place to emphasize the unity of people in the world than flying in space. We are all the same people, we are all human beings and I believe that most of us, almost all of us, are good people."

I have been blessed in my life to travel to space four times – and I can tell you that what Ilan was talking about is something you can feel down to your bones. When you see our planet from space – when you peer into the vast, beautiful expanse of blue and white and green – you don't see any borders. You can't hear any of the noise that comes from people disagreeing or arguing or fighting. You just see one, serene, beautiful planet.

In ways both large and small, I think that you all are a living embodiment of this spirit. I understand that the Space Generation Advisory Council now has thousands of members representing 100 countries. That's truly remarkable. *Give yourselves a round of applause!*

THE SPACE GENERATION

Now, I mentioned a few of the things you cannot see from space, let me tell you something that you can see – and that’s a sign around our planet that says “help wanted.” (Not really)

We’re counting on your generation. We’re counting on you to cure the previously incurable ... to tackle big challenges like climate change ... to teach us to live as one people on this beautiful planet.

These are all great challenges – and if they sound a little intimidating that’s because they are. But I firmly believe that you’re up for it.

Turning specifically to space exploration, let me state for the record that I have no doubt that the future is in good hands.

You truly are the space generation. Your friends and colleagues may very well take for granted the fact that we make use of satellites to call our friends, look up information or just entertain ourselves – in short, to connect us all no matter where we live.

People compare the growth of spaceflight to the growth of aviation. Within 50 years of the Wright Brothers' first flight, commercial air travel was widespread to the average person, and commerce depended on it.

We're not quite there yet with spaceflight, but 56 years after NASA was formed, we now have regular cargo delivery to low Earth orbit by two companies. Depending on how some things shape out in my country's own Congress, we are not that far away from commercial transport of astronauts to low Earth orbit.

This doesn't even take into account space tourism and the private companies that are going to take folks on suborbital flights.

In July, NASA announced that Robert Behnken, Sunita Williams, Eric Boe, and Douglas Hurley will be the first astronauts to train to fly to space on commercial crew carriers.

Citizen scientists and inventors are helping NASA with their ideas about asteroids, about Mars spacecraft, about innovative computer software and more. When you look at what's really going on in the field, it's incredible how much things have opened up and so much richness of innovation and inspiration is flooding into aerospace. People like you are all over the world, looking to create the future and helping NASA and our international partners continue to do the big things that no one else can.

JOURNEY TO MARS

Here's perhaps the greatest thing about all of this: as a species, we're only just getting started. With all the marvels of technology and innovation that we all take for granted, there is still wonder to behold. There are still marvels to create.

At NASA, we're on a Journey to Mars and I invite you to come along. As you may have gleaned from the conversations here at IAC, there's a new consensus emerging around our plan, timetable and vision for sending astronauts to the Red Planet in the 2030s.

All space exploration expands the frontiers of scientific knowledge and improves life for everyone on Earth. I think if we start from that point, we're off to a great start.

Any human mission to Mars is going to involve the efforts of many nations. In fact it already does, as we can see from the variety of spacecraft currently studying the Red Planet.

Now I know that I don't need to convince any of you here who are a part of the Space Congress that Mars matters.

Sometimes, though, as the great Civil Rights leader from my country, Martin Luther King, is purported to have said, it's important to preach to the choir, otherwise they might stop singing.

So I'm going to ask you for a little audience participation. I want you to repeat after me ... "Mars matters."

Because its formulation and evolution are comparable to Earth's ... Mars matters.

Because we know that at one time it had conditions suitable for life ... Mars matters.

Because what we learn about the Red Planet may tell us more about our own home planet's history and future ... and because it might just help us unravel the age-old mystery about whether life exists beyond Earth ... Mars matters.

So when your friends and colleagues ask you if space exploration is important you should tell them ... "Mars matters."

As you likely know, robotic explorers have studied Mars for more than 40 years. When our latest Mars spacecraft, *MAVEN*, arrived last September to study the Red Planet's upper atmosphere, it joined a fleet of orbiters and rovers that we already had on the surface – and have had on the surface since *Viking I* and *II* landed in the 1970s.

Next year, we will send the *InSight* lander to study the planet's core and in 2020, a new rover called *Mars 2020* will build on the success of *Curiosity* and help us prepare for human arrival at Mars and, for the first time ever, it will cache a sample for later return to Earth.

Now, as I continue to tell you about a few of the things that we at NASA are doing, I also want to take an opportunity to remind you that so many of our efforts are things we're doing together with other countries. A great example is *ExoMars*, a European mission to search for biosignatures of Martian life.

The path for human exploration of Mars begins in low-Earth orbit aboard the International Space Station (ISS), our springboard to the exploration of deep space.

Now, I hope you're sensing a theme here when I remind you what that first word in "International Space Station" is. That's right, "International."

As we speak, astronauts aboard the ISS – from several different countries -- are helping us learn how to safely execute extended missions deeper into space.

Our next step in the Journey to Mars is deep space, where NASA will send the first mission to capture and redirect an asteroid to orbit the moon. Astronauts aboard the *Orion* spacecraft will explore the asteroid in the 2020s, returning to Earth with samples. This experience in human spaceflight beyond low-Earth orbit will help NASA test new systems and capabilities – such as advanced, high power solar electric propulsion – we'll need to support a human mission to Mars.

Since we last met, the *Orion* spacecraft had its first flight test last December – and if you don't mind me saying, we nailed it!

Meanwhile, the Space Launch System or SLS that will someday launch our astronauts into deep space continues to hit milestone-after-milestone.

Meanwhile, because technology drives exploration, engineers and scientists are working hard to develop the technologies astronauts will use to one day live and work on Mars and safely return home ... from space suits ... to habitats ... to advances like Low Density Supersonic Decelerators that will allow heavier spacecraft to land safely on places like Mars.

In order to pioneer space these new technologies are critically important.

The further we advance and learn and discover, the more our technologies will need to evolve, be upgraded and grow. They are what will allow us to establish a sustainable human presence on Mars.

The great news is that in many cases, technological advances are “two-fer” or even “three-fer” because they also provide spin-off benefits and create high-paying jobs here on Earth.

CONCLUSION

As I close, let me just challenge you once again to seize the opportunity that flows from this “teachable moment” and to remind your friends and colleagues why it’s important to reach for new heights.

Perhaps you'll encourage them to pursue studies and careers in what we in the United States often call the "STEAM" disciplines of science, technology, engineering, the arts and math."

I want to leave you today with the words of one of Israel's founding fathers – and a living legend. The great Shimon Peres.

"The most important thing in life is to dare. The most complicated thing in life is to be afraid. The smartest thing in the world is to try to be a moral person."

As you continue to look upwards toward the heavens and beyond, let me encourage you to work hard, to study hard and to not be afraid of failure. May you continue to "dare," to "dream," and to answer our planet's "help wanted" ad.

Thank you. Shalom! Keeping doing what you're doing.